State of the Area
Beltsville Area
FY 1993

1. Introduction

The Beltsville Area (BA) operates under a management structure that includes seven first-line BA management units (MU's) serving the Office of the Area Director:

- Natural Resources Institute (NRI)
- Plant Sciences Institute (PSI)
- Livestock and Poultry Sciences Institute (LPSI)
- Product Quality and Development Institute (PQDI)
- Beltsville Human Nutrition Research Center (BHNRC)
- U.S. National Arboretum (USNA)
- Facilities Management and Operations Division (FMOD)

Institute Directors or equivalent-level Administrators (Center Directors and FMOD Deputy Area Director) head each of these units. Collectively, the Area Director, Associate Area Director, six Institute/Center Directors along with the Associate Institute Director for PSI, and the FMOD Deputy Area Director make up the BA management team. Many of the day-to-day management responsibilities and authorities have been delegated to the Institute/Center Directors and Deputy Area Director to facilitate the timeliness of decisions and increase the efficiency of operations.

The FY 1993 Annual Resource Management Plan (ARMP) for BA was developed based upon a net-to-location budget allocation of $88.1 million. The budget will support a projected Federal staff of about 1438 FTE's. Included in this total are 446 SY positions, including research associates (101). The number of PFT SY's dropped by 10 during FY'92.

The capture of soft dollars through CRADA's, grants, and reimbursable agreements continues to be an important Area activity. For FY'93, the total value of soft dollars is $3,583,405. The Area will increase its efforts to encourage its scientists to submit grant proposals, especially to NRI and to develop technology transfer agreements with industry (e.g., CRADA's). In FY'92, 4 of 30 proposals for the USDA Competitive Grants were funded ($528,000). Two BARD grants were also awarded to BARC scientists ($127,000).

The Annual Resource Management Plans accompanying this State of the Area Report are complete and consistent with the guidelines issued by the Financial Management Division (FMD) and the Budget and Program Management Staff (BPMS). Most of the MU's are in adequate-to-good financial condition; a few, however, are marginal. Of 50 MU's, eight are between 10K-20K discretionary $/SY and seven are below 10K/SY. Considerable attention will be given to taking the management actions necessary to ensure that the Agency's high priority research is protected. In general, an MU will not be allowed to recruit a PFT research scientist if its discretionary resources are less than $35,000 per SY and/or the total funding per SY averages less than $250,000 NTL. The BA management team will continue to work with the National Program Staff (NPS) to adjust program or staffing, as needed, to achieve the proper balance relative to available funds and program priorities.

2. Broad Management Issues and Initiatives

A number of broad, cross-cutting issues affect all of the operations, programs, and personnel in the Beltsville Area. The BA management team will take positive actions to address these issues. Special efforts will be made to keep NPS and Administrative Management (AM) leaders informed as plans and initiatives are undertaken to deal with these issues. Broad Agency support will be needed to be successful in these areas.

2.1 Safety, Health, and Environmental Compliance

The Beltsville Area continued in FY'92 to make progress in the area of safety, occupational health, and environmental protection. All requirements of the Consent Judgment (CJ) and the Federal Facility Compliance Agreement (FFCA) were successfully completed.

The preliminary score under the Hazard Ranking System of Superfund for BARC exceeds the Environmental Protection Agency's (EPA's) cutoff score of 28. Therefore, BARC will most likely be listed on EPA's National Priority List (NPL). Because of BARC's potential for being included on the NPL, a temporary Environmental Protection Specialist was added to the Safety and Health Staff to oversee remediation activities that will be required. The Office of General Counsel is seeking to begin negotiation of a multi-party agreement between the Maryland Department of the Environment (MDE), the EPA, and ARS.

The preliminary assessment/site investigation of BARC revealed that additional soil and water sampling and analysis of the BARC Biodegradable Site was necessary. Therefore, further characterization of the site and its hazardous areas was performed. Since the Biodegradable Site is located on BARC land that is to be transferred (sold) to the Washington Metropolitan Area Transit Authority (WMATA), and the site will be disturbed by WMATA's planned construction of a maintenance and storage yard, MDE has advised ARS that cleanup (excavation) of the site is required. The Comprehensive Environmental Response, Compensation, and Liability Act also requires that all remediation activities be completed prior to the transfer of the site to WMATA.

The Area Office is currently working with the Facilities Division (FD) to award a contract to accomplish the cleanup activities required by MDE. The projected cleanup costs are estimated at about $8 million, depending on the extent of hazardous waste contamination found in the site. Currently, the Agency has earmarked $6.0 million in FY'92 for this initiative.

The Nuclear Regulatory Commission (NRC) included Beltsville in its inspection of the USDA, listing several minor violations of NRC regulations. A Health Physicist was added to the Safety and Health Staff to manage the Area's Radiological Safety Program. The Area Safety and Health Manager and the Health Physicist are currently working with the Radiological Safety Staff to define clearly the Area's Radiological Safety Program requirements.

The BARC low-level radioactive waste burial site continues to be a concern. A contract is in place to perform hydrogeologic characterization and environmental monitoring of this site. The project is being overseen by the Beltsville Health Physicist with assistance from the Radiological Safety Staff.

Federal regulations, 40 CFR Part 280, require that by 1998 all BA Underground Storage Tanks (UST's) must be replaced or retrofitted. A $543,000 HPRL item for UST removal was awarded by Headquarters to BARC in FY'92 to facilitate this need. Meanwhile, all tanks have to be monitored monthly through a leak detection program. State of Maryland regulations are more stringent than those specified by EPA. EPA granted Maryland full authority to run their tank program, including having authority over Federal facilities.

BA has completed its storage tank inventory (189 UST's), including the size and location of each tank, and whether the tank is active, abandoned, or temporarily closed. Tank tightness testing has been completed. Manual gauging for detection of leaks is an ongoing monthly task.

U. S. National Arboretum has been working with the District of Columbia Environmental Regulation Administration (DCERA), for more than a year in trying to remove a leaking UST and cleanup contaminated soil. The leaking UST and the contaminated soil surrounding the tank have been removed, and a new tank, with the required monitoring devices, has been installed. During the removal process, it was discovered that the leaking petroleum had extended a distance from the original location. The DCERA required additional testing to determine the extent of the contamination. A Site Characterization Report was completed, which identified the extent of the underground oil plume. The DCERA has also requested that an Aquifer Characterization Report be completed. Data from this report will be used to develop a plan of action for remediation of the free petroleum product in the soil. A 5-year plan has been developed and is being implemented that will ensure compliance with Federal, State, and local regulations by 1998. The total estimated cost of the 5-year plan is projected to be $4.2 million.

Funding to support BA's Storage Tank Management Plan has been identified in OMB's A-106 Pollution Abatement Projects process and funded thus far with Departmental Hazardous Waste Cleanup (HWC) funds. BA will continue to work with the Safety and Health Policy Staff to obtain HWC funds in future years.

The need for a Biosafety Program is being evaluated. The requirements of this program include registration of etiologic agents, special inspections to certify compliance with national biosafety regulations and guidelines, participation in activities of the Beltsville Area Research Animal Committee, compliance with medical waste regulations, etc. A decision on addition of a Biosafety Officer will await an in-depth review of the Safety and Health Office scheduled for January 1993.

2.2 Facility Modernization

The concepts for planning the modernization of ARS BA facilities developed by Gilbert and Associates continue to guide modernization efforts. For several reasons their long-range strategic plan can be significantly revised and improved. Specifically, Gilbert's selection of projects was based heavily on

available construction authority at the time of their study. The BA now has "economic analysis" authority when modernizing space. This enables the BA to make significant changes regarding the buildings to select for modernization and how they can be most effectively modernized. In addition, the schedule for implementing selected modernization projects was driven more by the need to obligate annual funds received rather than to enable scientists to move only once. Most BA modernization money has since been shifted to the building and facilities account, which is no-year money. Because of the removal of those two restraints, the Scheduling Review Group (composed of FD and FMOD members) has made significant progress in revising the Gilbert strategic plan and adhering to the basic concepts of their recommendations, which are to optimize the mix of demolish and build new, gut and rebuild, and repair space as well as schedule the construction work so scientists will move only once.

The greatest variable in attempting to optimize this mix in modernizing facilities is the need to justify new space for BHNRC rather than gutting and rebuilding Buildings 306, 307, and 308. The justification must be based on their unique program requirements rather than just the inadequacies of the buildings for "typical" research conducted at Beltsville. An economic analysis is underway to develop information necessary to make that decision. Once made, the Gilbert strategic plan will be revised.

To insure proper obligation of the building and facilities funds (no year) and the salaries and expenses account (annual appropriation/Renaissance 93), the "Criteria For Identifying and Funding BA Modernization Projects" was developed in consultation with BPMS and FD.

During the past 7 years (FY'86 to FY'92), over $75 million has been obligated to upgrade and modernize ARS BA facilities. Congress has appropriated nearly $63 million of that amount for modernization. The remaining $12 million came from various salary and expenses appropriations. Over $13 million are included in the FY'93 appropriations for BA modernization under the buildings and facilities account, not counting the annual Renaissance 93 funds ($2.3 million).

Currently, approximately 35 contracts are managed by the FD to support the BA Modernization Program. Major projects include:

- East Wastewater Treatment Upgrade
- New Plant Sciences Building
- Gut and Rebuild Building 001
- Free Stall Dairy Barn
- Renovate Building 007
- Greenhouse Range 2 Complex
- West Wastewater Treatment Upgrade
- BARC-East Water System
- Repair/Replace Selected Steam Lines
- BHNRC Economic Analysis

A study will be initiated in FY'93 to determine the requirements for complete modernization of the Livestock and Poultry Sciences Institute complex of buildings in the Building 200 area. Included will be plans to co-locate the Animal Parasitology Unit and other LPSI components along with modernized animal facilities.

Finally, the long-range strategic plan developed by Gilbert identified 219 buildings (approximate 240,000 square feet of space) to be demolished as a part of BA modernization. An additional 28 buildings have been identified for demolition by the BA Staff and more will likely be identified in the revised Gilbert strategic plan. Beginning in FY'90 and continuing through FY'92, 171 buildings were demolished. These ranged in size from 24 square feet to 10,000 square feet, with a few over 20,000 square feet.

2.3 Land Management Planning

Long-term planning for the effective use and management of ARS land resources at Beltsville continues to be an important issue. This is especially significant in view of the projects outlined in the Beltsville Modernization Plan and the requirement to update and revise the Master Plan as mandated by the National Capital Planning Commission. Several other scientific organizations such as the Smithsonian's Museum of Natural History, the American Type Culture Collection, and the University of Maryland continue to express an interest in co-locating future research facilities at BARC.

A contract for a boundary survey of BARC was awarded in FY'92. A Master Plan that includes requirements to describe and analyze existing and proposed conditions continues to be the Area's number one priority. The estimated cost for the Master Plan is projected to be $900,000, which is requested on the Area's HPRL (Item No. 1). The Master Plan database (including maps) will be easily accessible through an automated inventory of all the land, building, and utility information that will be gathered and analyzed. Such a system will initially be costly to set up and will require specialized expertise for its continuing utilization. A committee has been established that will define and recommend the scope of an automated system for the BARC Land Management/ Use Committee's consideration.

2.4 Future Program Direction

During FY'92, the BA Management Team worked closely with the NPS to incorporate about $2.4 million of budget increases into Area programs. As a result, increased emphasis is being given to research on water quality, food safety, mites of honeybees, corn earworm control, human nutrition, lyme disease prevention, global climate change, mechanisms of hormonal control of insect development, virus control in florist crops, and assessment of minor use pesticides. Also, the U.S. National Arboretum germplasm evaluation and enhancement program was fostered by appropriation of funds to improve the irrigation system.

Three new Research Leaders (RL's) were selected to replace and continue strong leadership of BA programs:

David Chitwood, Nematology Lab, PSI
Robert Lumsden, Biocontrol of Plant Diseases Lab, PSI
Patricia Millner, Soil Microbial Systems Lab, NRI

There are no RL vacancies at the start of FY'93. However, RL vacancies are expected in two labs, and two key positions on the BA Management Team should be filled shortly after the beginning of the fiscal year (Directors of BHNRC and USNA).

Cooperative efforts with industry have increased and will expand further to promote technology transfer. New or improved technologies are documented in the BA technology transfer report for FY'92. Beltsville scientists have formal cooperative interaction (via CRADA's, CRADMOU's, Specific Cooperative Agreements, Trust Funds, or Reimbursable Agreements) with about 35 private sector firms or organizations.

The BA, in partnership with the NPS, is identifying broad program areas that reflect ARS program thrusts and that link together multidisciplinary teams (and inter-MU cooperation). Because BA has many unique resources and capabilities, such research projects are viewed as platforms on which to build large-scale research efforts utilizing expertise from across the Area's institutes. Recent examples are:

2.4.1 Task Force on Integrated Pest Management.

This initiative of PSI evaluated the extent and diversity of BARC programs that deal with the biocontrol of pests. Twenty-three projects were identified, including 40 formal cooperative agreements and many informal cooperative agreements. The Task Force concluded that BARC laboratories have both the critical mass and the diversity of expertise needed to carry out both the basic research and the adaptive research needed to demonstrate field efficacy and safety (a vital step that industry is frequently reluctant to pursue). The Task Force identified several candidate BARC projects and potential sources of support. The NPS has concurred with their findings and is supportive of the goals. The Area will give priority to help obtain the needed funds to initiate the proposed field-scale demo projects.

2.4.2 Long-Term Sustainable Agriculture Study.

An inter-Institute program has been launched that will compare, on a long-term basis, conventional and "sustainable" agricultural practices. Two sites totaling 42 acres have been selected. The agricultural practices to be compared are different tillage systems, fertilizer inputs, and varying levels of energy inputs. One site, (25 acres) is on sloping land, which will provide data on the influence of management practices on erosion and run-off. This project will provide an educational opportunity for the public at large, and for agriculturists, in addition to providing research data on different agronomic practices.

The Area intends to increase large-scale projects such as these to encourage multi-disciplinary and inter-unit collaboration that seeks to evaluate, on a large scale, the new technologies and practices arising from our research.

2.4.3 Sustainable Vegetable Production

A research project is being carried out by the Plant Sciences Institute and the Natural Resources Institute to develop a no-tillage, low input, high-yielding vegetable production system adapted to sustainable agriculture. Using tomatoes as a model species and two winter annual legumes as cover crops for use as organic mulches, Drs. Abdul-Baki and Stommel of the Vegetable Laboratory (VL) were able to more than double the yield while keeping production cost low, thus making vegetable production less expensive. Dr. Cantelo (VL) is assessing the reduction of infestations by Colorado potato beetle in this system; Dr. Teasdale, Weed Science Laboratory, is assessing the suppression of weeds by the plant mulch; Dr. Chitwood, Nematology Laboratory, is evaluating the effect on the plant mulch of the build-up of nematode populations; Dr. Korcak, Fruit Laboratory, is studying nitrogen input to minimize its loss and maximize its use efficiency; and Dr. Millner, Soil Microbial Systems Laboratory, is examining carbon and nitrogen transformations and mycorrhizal symbiosis.

2.4.4 Human Nutrition Research Opportunities

During the special RL Meeting in February 1992, presentations by scientists from five Beltsville Institutes/Centers revealed the potential for future collaborative research in human nutrition thrusts. A focus on fruits, vegetables, and low-fat meat as especially nutritious foods was represented by laboratories in the Beltsville Human Nutrition Research Center (Nutrient Composition and Vitamins and Mineral Nutrition Laboratories), Natural Resources Institute (Climate Stress Laboratory research on high oleic acid soybeans), Plant Sciences Institute (Vegetable Laboratory research on genetic improvement of carotenoid content in tomatoes), Livestock and Poultry Sciences Institute (Nonruminant Animal Nutrition Laboratory research on MRI imaging of body composition in pigs), and Product Quality and Development Institute (Meat Science Research Laboratory research on low-fat ground beef). The new Director of the BHNRC will be charged with fostering these and other collaborative endeavors between the Center and other Institutes at BARC.

2.4.5 Functional Proteins Thrust

With Insect Neurobiology and Hormone Laboratory (INHL) as the focal MU, highly productive linkages have been established in structure elucidation and assignment and <u>de novo</u> synthesis of proteins that are functionally important in insects and higher animals (such as neuropeptides and reproductive peptides). In these interactions, INHL is collaborating with MU's in PSI, LPSI, and BHNRC. An important amino acid sequencing research function in the Livestock Insects Laboratory (LIL) also contributes to the other units.

Dr. Wagner (LIL) has been responsible for purification of certain peptides, peptide sequencing, and myotropic bioassays. In turn, peptide syntheses are done by Dr. Kochansky (INHL), and mass spectrometry analyses of peptides are done by Mr. Lusby (INHL). Collaborative interactions also have provided insight into the structure and function of genes and their products. Dr. Owens of the Plant Molecular Biology Laboratory (PMBL) used molecular techniques to modify a gene. Dr. Kochansky synthesized and Dr. Wagner purified the modified peptide produced by the altered gene. Dr. Owens then assayed for functionality (toxicity toward bacterial pathogens) of the altered peptide. This type of cooperation demonstrates how expertise from different BARC Institutes can be utilized to the mutual benefit of all.

2.4.6 Interactions in Plant Molecular Biology

Scientists with state-of-the-art experience in molecular biology are concentrated in the Plant Molecular Biology Laboratory, Plant Sciences Institute. These scientists are bringing molecular expertise to bear in 24 projects in 14 laboratories in the Plant Sciences Institute, Livestock and Poultry Sciences Institute, Product Quality and Development Institute, and Natural Resources Institute. Benefitting projects address the entire spectrum of agricultural problems ranging from crop protection to product quality and environmental safety. Future projects will address contributions of molecular biology to tailoring nutritional quality of foods through cooperation with laboratories in the Beltsville Human Nutrition Research Center.

2.5 Equal Employment Opportunity and Affirmative Actions

BARC made significant progress in achieving planned objectives outlined in the FY 1988 through FY 1992 Affirmative Employment Program Plan. Through an indepth program analysis and problem barrier identification, BARC established specific objectives, action items and numerical objectives to: (1) ensure that the employment representation of minorities and women is at parity with the civilian labor force and other available applicant pools; (2) encourage the continued upward movement of minorities and women; and (3) eliminate problems/barriers that impede equal employment opportunity for minorities and women.

The accomplishment of planned objectives has positive implications for BARC. The overall workforce increased from 1182 in September 1988 to 1229 in September 1992. The increase of 49 employees represents a 4.1 percent growth over the 5-year period.

All EEO groups are at parity with their level of representation in the Civilian Labor Force (CLF) except White females and Hispanics. White females only show a slight level of underrepresentation. They are 30.5 percent of the BARC work force compared to 34.5 percent of the CLF. Hispanics continue to be severely underrepresented. They represent less than 1 percent of the BARC work force compared to 6.4 percent of the CLF. BARC continues its efforts to increase employment and outreach efforts through participation with Hispanic organizations such as LULAC (League of United Latin American Citizens), HACE (Hispanic American Cultural Effort) and the Hispanic Association of Colleges and Universities.

All EEO groups showed strong gains in representation except Black and Hispanic males; however, BARC recently was successful in recruiting and hiring a research scientist who is a Black male.

The Professional and Technical job categories continue to be the most populous even though significant growth was made in the Administrative category. Overall representation in this category increased 120 percent during the 5-year period. Consistent with this trend, BARC plans to broaden opportunities to high school and college students in the Administrative area through the various student employment programs.

Five major occupational series are tracked by BARC. These are: Chemistry, Entomology, Biological Technician, Secretary, and Animal Caretaking. The BARC FY 1988 through FY 1992 Affirmative Employment Program Plan noted underrepresentation of women and minorities in each of the major occupational series. Although underrepresentation of some EEO groups continues for some series, significant progress has been made during the 5-year cycle.

Jobs in Chemistry show all EEO groups are at parity with their CLF representation for the Professional category except Black females, Hispanic males and Native Americans.

All EEO groups except Hispanic females and Asian males show levels of underrepresntation to severe underrepresentation in Entomology.

In the area of Biological Technician, all women, White females and Black males show levels of representation greater than the CLF for the Professional category. Black females, Hispanics, Asian and Native American males show levels of underrepresentation to severe underrepresentation.

White and Black females are at parity with the CLF for the Secretarial series. All other EEO groups are underrepresented to severely underrepresented when compared to the CLF.

In the area of Animal Caretaking, women, Hispanics, Asian females, and Native Americans are underrepresented to severely underrepresented for the series. White females and Blacks have reached parity with their CLF representation.

The grade distribution throughout all GS/GM (i.e., General Schedule/General Management grade groups 1-4; 5-8; 9-12, 13-15; and 16, 18, and Senior Executive Service) grade groups shows progressive upward movement of minorities and women over the 5-year cycle. Women and minorities show particularly strong rates of growth in mid (9-12), senior (13-15), and executive (16,18, and SES) level positions.

Overall employment throughout WG, WS and WL (i.e., Wage Grade/Wage System grade groups 1-4; 5-8; 9-12; and 13-15) grade groups declined slightly. However, Black males show some progress particularly in the WG 11-12 grade group.

Several important ongoing and new initiatives were implemented through FY 1992.

Since implementing the Demonstration Project in 1990, BARC has been successful in attracting and hiring minority candidates through use of the project recruitment incentives.

Fifty-three students participated in the FY 1992 Research Apprenticeship Program. Women comprised 64 percent of participants. Sixty-six percent of participants were minority.

Women also showed strong representation in the 1992 Summer Intern Program. They were seventy percent of participants.

In January 1991, BARC implemented the Mentor Program. Women and minorities are represented in the program at levels equal to or greater than their work force representation. Women are 68 percent of participants. Minorities are 18 percent.

The Mentoring Program has had positive results for mentees including career change or job reassignment and or return to college for the purpose of obtaining a degree. Mentors reported personal gratification and improved communication across organizational lines.

The program has been so well received that several other Federal agencies and departments have requested assistance on developing similar programs.

With the beginning of the new school year, plans are already underway by the Nicholas Orem Elementary School to tour the Beltsville Area Visitor's Center and to visit several of the labs. Visits are planned throughout October.

Nearly 200 employees have participated in Career Effectiveness training. Participation in the training is voluntary. The training focuses on personal skills development such as self-awareness, awareness of others, effective communication skills, conflict management, personal responsibility and team building.

In the coming fiscal year, BARC plans to implement an initiative to enrich the work experience of the technical employees to improve morale.

BARC was one of three ARS sites selected for an equal employment and civil rights program evaluation conducted by the Department. The evaluation covers analysis of various employment data, results of an employee survey questionnaire; and interviews of approximately 150 employees throughout all organizational levels. So far, preliminary findings appear favorable.

2.6 Management Team Building and Employee Communications

Team building and the enhancement of employee communications were fostered by several special programs this past year. RL meetings focused on scientific opportunities and management issues. The February 1992 RL Meeting was unique in that an entire half-day was devoted to presentations by scientists from several labs in five BA Institutes/Centers. These all related to the theme of opportunities in human nutrition research and potentials for collaborative research among Institutes/Centers at BARC.

The Administrative Branch, FMOD, launched a total quality management (TQM) process called Total Quality Service (TQS) in December 1991. TQS focuses on achieving both internal and external customer satisfaction by continuously improving the administrative processes. TQS defines customer satisfaction as "meeting or exceeding our customers' needs and expectations" and involves the entire Administrative Branch workforce. Administrative Branch employees have received the basic TQM training and now they are involved in assessing a representative sampling of their customers to determine the customers' needs and expectations. The results of this survey will be used to guide and focus the TQS efforts. In addition, the Facilities Engineering Branch, FMOD, began the TQM training process in 1992 and is developing a plan to implement TQM throughout the Branch in 1993. After a preliminary team building initiative in the Farm Operations Branch, FMOD, in 1993, TQM will begin in 1994.

On March 10, 1992, the Second Annual BARC Orientation and Poster Day featured the research of post-doctoral scientists and new scientists who have been permanently employed for 2 years or less. About 86 posters were displayed to stimulate interaction among the diverse MU's at BARC. The Proceedings of BARC Poster Day 1992 (ARS-102) included brief descriptions of the missions of each MU and a listing of their research scientists and postdoctoral associates as well as abstracts of each poster. Also, a special orientation session preceded the poster display, including discussions of ARS organization, culture, policies, and procedures.

A special Management Team Work Session on March 31, 1992, featured open discussion of eleven topics, including human resource management, training of new RL's, modernization, job performance, the Master Plan, "Vision 90" revisited, multi-year planning, and Area awards recognition.

A new newsletter "Under the Clocktower" is distributed quarterly to all BA employees to keep the workforce informed on new initiatives, research highlights, special honors and awards, progress in modernization, safety and environmental issues, and other items of general interest.

A revised "Research Index" was issued in April 1992 to update RL contacts and administrative contacts for the diverse research program in the BA. This was issued to coincide with the Agriculture and the Environment Celebration and BARC Open House of April 24-25, 1992, which afforded special opportunities for employee team building and communication across disciplines.

The BARC Awards Ceremony of June 17, 1992, represented the first Beltsville-wide awards event within the past 5 years. Over 60 employees at all levels were recognized by presentation of certificates, plaques, or cash awards. On June 23, 1992, a special ceremony honoring the departing Area Director also was well supported by employees at all levels in the BA workforce. An outpouring of kudos and good will indicated that the departing Area Director had been especially successful at instilling an atmosphere of team building in the Area.

2.7 Indirect Research Costs

The overall Indirect Research Costs (IRC) in the Beltsville Area for FY'93 will be $21.4 million; about 21.9 percent of the program allocation is spent for IRC. This is within 0.2 percent of the assessment for FY'92 and is well within the IRC range for BARC over the past 10 years.

An "IRC Working Group," appointed in November 1990 and composed of three Institute Directors, the Administrative Officer, and the Associate Area Director, continued to deliberate in 1992 on issues that were comprehensively evaluated in 1991. This Group met in March and April 1992 and reached the following conclusions and future action needs:

- Some errors exist in the Jones Model that has been used to assess space charges to MU's. This led to a list of Proposed Modifications to the IRC (Jones) Model that were either already incorporated in the FY'93 assessments or that will be studied in more depth for incorporation in FY'94 assessments. The most significant item on this list is the discovery that the assumed consumption of electricity in greenhouses is too high because of the incorrect current "cooling formula," which will be reassessed in time for FY'94 adjustments. This could result in substantial reductions in IRC for labs that utilize greenhouses and IRC increases for non-greenhouse-using MU's.

- It was discovered that 22 percent of BARC fuel (ostensibly used for heating) really is used for production of steam for autoclaves and other equipment. A Steam Generation and Utilization Study will be conducted in FY'93 to develop alternatives to reduce steam generation costs.

- The issue of whether to continue to charge all BARC units (via the IRC) for partial operation of the Nuclear Magnetic Resonance (NMR) facility in FY'94 and beyond is being deliberated. Currently about 12 laboratories are using NMR services. One alternative is to create an NMR research project (new CRIS) with funds generated by program redirections.

- An attempt to begin charging MU's for additional repair and maintenance (R&M) of buildings at BARC, via an IRC increase, was abandoned when the Working Group received evidence that such a move would cause many labs to fall below the desired level of discretionary funding.

- The USNA developed a system for improved IRC assessment to MU's following "refederalization" of facilities operations and a comprehensive Space Study that led to reassignment of space to projects relative to functional need in FY'92.

- The positive results of the BARC IRC Working Group during the past 2 years led to the appointment of a special "Task Force to Review the Cost of Doing Beltsville Area Research" in July 1992, when evidence of restricted future budgets became apparent. This Task Force, including representatives of all Institutes/Centers and AM, will develop long-term recommendations for cost reductions in FY'93.

2.8 Security

Security remains a major issue due to the size of the Center and its close proximity to the high crime areas of the City of Greenbelt and Prince George's County. This, added to the temptation offered by the open campus setting at BARC, makes our Center an inviting target for the criminal element working in the area. Fortunately, the addition of skilled, retired police officers and an equal number of well-trained, new-generation officers to the BARC Security Section has increased and greatly improved our ability to provide full-time patrol coverage. The addition of seven alarms and access control systems plus more security lighting has created a more secure workplace. This increased coverage by both patrol personnel and electronic monitoring has resulted in the virtual elimination of criminal activity at BARC. The Security Section's goal is to improve delivery of security services and maintain the current level of trust by the employees, visitors, and residents at BARC.

3. Major Program/Management Issues

3.1 Facilities and Maintenance Operations

A major concern is the adequate staffing needs for the Safety and Health Office (SHO). Biosafety Officer and Radiation Safety Technician positions have been requested. Because of budget constraints, the Area will move with care in addressing these requests. As a first step, the Area will conduct an in-depth review of the SHO, utilizing experts from other Federal and State organizations with program, facility and organizational features similar to the BA. It is expected that the results of the review will guide subsequent management decisions.

The reduction in BA staff expected because of the current and projected flat budgets will necessitate a hard look at FMOD's support services to determine where and to what degree such services can be reduced to compensate for reduction in the program's needs. This will be difficult and Headquarters' assistance will be sought.

3.2 Livestock and Poultry Sciences Institute

Although LPSI is in overall good financial health, two MU's will need immediate attention. The Livestock Insects Laboratory and the Protozoan Diseases Laboratory are at $10,000 or less in discretionary dollars per SY. Downsizing of personnel and restructuring are possible solutions. The Area will work with NPS and AM to make the necessary changes required to protect the high priority research in these programs. A plan for long-term large animal research at Beltsville is being developed; an executive summary will be available in October 1992.

3.3 Beltsville Human Nutrition Research Center

The Nutrient Composition Laboratory is in serious financial condition (less than $5,000 discretionary dollars/SY). Fortunately, the MU receives over $200,000 in outside funds which allows this program to go forward. However, when a new Director arrives, a plan to return this important program to a satisfactory level of base support will receive immediate attention.

3.4 U.S. National Arboretum

Several issues require immediate attention and will be the top priority of the new Director, expected in FY'93:

The Bird Garden is inadequately funded to meet its Congressionally-mandated objectives. A plan will be developed to try to secure increased funds so that the project can be completed and maintained.

The proposed addition of a tropical and a temperate climate greenhouse to the North American Bonsai Pavillion poses a potential financial liability for the USNA. If ARS must cover the additional utility costs, a budget increase will probably be necessary.

The Research Unit is marginally funded, especially the Delaware, Ohio, work site. A plan to increase the funding for the Unit's high-priority projects will be develped in collaboration with NPS.

The allocation of staff, resources and assignments between the Garden and Germplasm Units needs reconsideration. There is confusion over responsibilities and perhaps duplication of effort. A restructuring plan will be developed.

3.5 Natural Resources Institute

The base funding levels for the Pesticide Degradation Laboratory and the Climate Stress Laboratory are the chief issues for this Institute. The Area is now developing a plan that will involve restructuring of three programs including staff reduction that will result in increasing support for the high priority projects. This plan will be discussed with NPS in early FY'93.

A second concern for NRI is the long-term funding for the NMR Unit. Because of its as yet limited clientele, a system of back charges to users will not be sufficient. Further, charging the Unit's complete costs to the Area IRC is questionable and controversial. The Area will give this problem close attention in FY'93 with the aim of developing a more reasonable financial support system for the Unit in FY'94.

3.6 Plant Sciences Institute

Chief among concerns in PSI are the poor financial status of the Systematic Entomology Laboratory, the Fruit Laboratory, and the National Germplasm Resources Laboratory. Plans are being developed to improve the support levels

of these Units. Retirements are expected in all three units and these vacancies will not be backfilled. Further downsizing may be necessary and this is being studied.

3.7 Product Quality and Development Institute

The chief concern of this Institute is the uncertainty of the housing for the Family Economics Research Group (FERG). They are currently housed with APHIS and HNIS in GSA-rented space. However, APHIS is planning to consolidate elsewhere in Prince George's County. The potential for HNIS and FERG to again share rent-free space with APHIS is not clear, and the Area will initiate discussions on this with APHIS. If FERG had to be housed at BARC, the resulting space costs to the Unit would be beyond their means at the current base support level.

State of the Area
Beltsville Area
FY 1992

1. Introduction

The Beltsville Area (BA) operates under a management structure that includes seven first-line BA management units serving the Office of the Area Director:

- o Natural Resources Institute (NRI)
- o Plant Sciences Institute (PSI)
- o Livestock and Poultry Sciences Institute (LPSI)
- o Product Quality and Development Institute (PQDI)
- o Beltsville Human Nutrition Research Center (BHNRC)
- o U.S. National Arboretum (USNA)
- o Facilities Management and Operations Division (FMOD)

Deputy Area Directors (DAD's) or equivalent-level Administrators (Center Directors) head each of these units. Collectively, the Area Director, Associate Area Director, and the seven DAD's/CD's make up the BA management team. Many of the day-to-day management responsibilities and authorities have been delegated to the Deputies to facilitate the timeliness of decisions and increase efficiencies of operations.

The FY 1992 Annual Resource Management Plan (ARMP) for the Beltsville Area was developed based upon a net-to-location budget allocation of $83.4 million. The budget will support a projected Federal staff of about 1388 FTE's. Included in this total are 442 SY positions. Of these, 355 are PFT SY's, the same as in FY '91.

Though the FY '92 ARMP has been developed based upon a budget allocation of $83.4 million, the total funding that must be managed during the year is likely to be close to $100 million. In FY '91, for example, the ARMP was built around an initial allocation of $79.5 million. However, by the end of FY '91, due to budget increases and the additions of other temporary funding, the official financial plan for the Area was $98.5 million. This included $5.1 million in reimbursable agreements and almost $1 million in the trust fund accounts. In FY '91, BA scientists submitted 34 proposals to the Competitive Research Grants Office in USDA for funding. Six of these proposals were approved and funded at a level of $692,000. The grants along with over $2 million in other soft funds will be available to support the Area programs in FY '92.

The Annual Resource Management Plans accompanying this State of the Area Report are complete and consistent with the guidelines issued by FMD and BPMS. Most of the management units (MU's) are in adequate-to-good financial condition; a few are marginal. In general, an MU will not be allowed to recruit a PFT research scientist if its discretionary resources are less than $20,000 per SY and/or the total funding per SY averages less than $200,000 NTL. There are exceptions such as the Family Economics Research Group and the Systematic Entomology Laboratory. However, the general rule applies. The BA management team will continue to work with the National Program Staff (NPS) to adjust program or staffing, as needed, to achieve the proper balance relative to available funds and program priorities.

Based upon the January discussions and the April meeting of the Modernization Committee, the FY '93 budget recommendations were developed and submitted to the Agency (See Appendix, page 10). At the current time, approximately 70 contracts are being managed by FCMD to support the Beltsville Modernization Program.

Finally, the long-range strategic plan developed by Gilbert and Associates identified 219 buildings (approximate 240,000 sq. ft. of space) to be demolished as a part of Beltsville Area Modernization. An additional 28 buildings have been identified for demolition by the Beltsville Area staff. In FY '90, 72 small animal and storage buildings were demolished at a cost of $97,750. The cost includes asbestos testing and removal. In FY '91, 43 additional buildings were scheduled for demolition; $200,000 was set aside for that purpose. The remaining buildings will be scheduled for demolition in subsequent years as funds are available.

The Appendix (page 10) recaps the Facility Modernization Projects approved or recommended for funding for FY '91, FY '92, and FY '93.

2.3 Land Management Planning

Long-term planning for the effective use and management of the ARS land resources at Beltsville continues to be an important issue. This is especially significant in view of the projects outlined in the Beltsville Modernization Plan and the requirement to update and revise the Master Plan as mandated by the National Capital Planning Commission. In addition, a number of other scientific organizations such as the Smithsonian's Museum of Natural History, the American Type Culture Collection, and the University of Maryland have expressed an interest in co-locating future research facilities at BARC.

The BARC Land Management/Use Committee has considered current and projected land uses at Beltsville and has developed criteria for a Statement of Work (SOW) for the Master Plan and for a Boundary Survey to be initiated in FY '92. The SOW for the Master Plan will include requirements to describe and analyze existing and proposed conditions; the relationship of proposed land uses to the BARC and ARS missions; an environmental assessment; acreage uses; and inventory maps of land use and proposed land use by numerous categories, including transportation needs, buildings and fences, wooded and wetland sites, buffer zones, topographical features and landscaping, utilities, waste disposal sites, watersheds, experimental sites, and animal feed supply sites. Vicinity maps will depict features of the community that surrounds BARC. A detailed narrative is to include existing and long range community participation, historic preservation items, transportation planning, energy conservation, water quality management, intergovernmental collaboration, utility upgrades, hazardous waste marshalling, guidelines for land acquisition and disposal, and BARC modernization.

The projected cost for a new Master Plan in FY '92 is estimated to be within the range of $550,000 to $750,000. The cost estimate for the Boundary Survey needed to prepare an accurate Master Plan is $237,000. The BARC Land Management/Use Committee suggests that the funding of this project will represent a prudent investment for all of ARS, in that the BARC land mass represents an important prime real estate holding for the Agency. Thus, ARS is not unlike a major corporation engaged in a wise assessment of its real estate resources. (Funding for these projects is requested in the Area FY '92 HPRL as Items No. 1 and 5.)

The Master Plan database (including maps) should be made efficiently accessible indefinitely through a computerized inventory of all the land, building, and utility information that will be gathered and analyzed. This computerization can be best accomplished by an investment in an AUTOCAD system. Such a system would initially be costly to set up and would require specialized expertise for its continuing utilization. The Land Management/Use Committee recommended that BARC initiate an "AUTOCAD Design Study" in FY '92. This recommendation is under consideration. Funds in the FY '92 Area Reserve have been "earmarked" for this study.

2.4 Future Program Direction

The organizational structure of the Beltsville Area is closely aligned with the program objectives in the Agency's Program Plan. Each Deputy Area Director is charged with the responsibility for working with the National Program Staff to ensure that the Beltsville Area programs conform with the guidance in the ARS Program Plan. In addition, other documents are used to ensure that the priorities at Beltsville are consistent with the priority needs of the Agency. Guidance is provided by the Agency's budget narratives for future program thrusts; the CRIS project rankings jointly agreed to by the Area Directors and NPS during the AC workshops held in February 1990; and the VISION 90 Report jointly developed by the BA management team.

During FY '91, the BA management team worked closely with the NPS to integrate almost $7 million of budget increases into the ARS programs at Beltsville. Emphasis was placed on strengthening future research on global climate change, water quality, plant and animal germplasm, animal health, biological control, weed control, and human nutrition research. Two Laboratories in LPSI were realigned to increase support for national programs on the evaluation and preservation of animal germplasm. The Plant Hormone Laboratory was merged with the Horticultural Crops Quality Laboratory to better coordinate future research at BARC on the postharvest quality of fresh fruits and vegetables.

Five new Research Leaders were selected to provide stable leadership for important current and future programs:

Judith Hallfrisch, RL, Carbohydrate Nutrition Lab, BHNRC
Robert Wright, RL, Environmental Chemistry Lab, NRI
Larry Johnson, RL, Germplasm & Gamete Physiology Lab, LPSI
Caird Rexroad, RL, Gene Evaluation & Mapping Lab, LPSI
Morse Soloman, RL, Meat Science Research Lab, PQDI

There are no existing RL vacancies; however, two vacancies are expected in FY '92 due to either planned retirements or reassignments, i.e., the Biocontrol of Plant Diseases Lab (Papavizas) and the Soil Microbial Systems Lab (Kaufman).

The effectiveness of future programs is dependent upon having modern instrumentation and computer systems. Through the cooperation and support of the NPS, AM staff, and BPMS, the Beltsville Area was able to make significant strides in upgrading its scientific instrumentation during the past year. Funding to replace the GRIN computer system was made available (approx. $600,000); a major new triple stage tandem mass spectrometer with accessories was acquired for basic research on insect neurobiology ($475,000); a new electron microscope with 40 fold increase in resolution was acquired for macromolecular cell studies ($200,000); and three new mass spectrometers were acquired for human nutrition research, totalling almost $500,000. This instrumentation will allow ARS scientists at Beltsville to remain in the forefront of critical new areas of investigation.

Cooperative efforts with industry collaborators will continue in an effort to promote transfer of new technologies to the user community. Almost 100 new or improved technologies are documented in the BA technology transfer report for FY '91. Significant among these is the first EPA registration of a naturally occurring soil microorganism (Gliocladium virens) for the biocontrol of a plant disease. This technology is being transferred through a cooperative link with the W. R. Grace Company. BA scientists have formal cooperative interactions with about 25 private sector firms or organizations, many of which provide funding through trust fund arrangements. These cooperative activities help to ensure that the research programs at Beltsville continue to address important problems essential to the future vitality of the agricultural industry.

2.5 Equal Employment Opportunity and Affirmative Employment Programs

Significant progress has been made in accomplishing the hiring objectives established in the Multi-Year Affirmative Employment Program for Minorities and Women. Several programs and initiatives are underway or planned to increase career opportunities of support personnel, improve morale, increase the visibility of the Agency in the community, and to assist in the national effort to increase the availability of scientifically-trained citizens.

Several of the hiring objectives projected to be accomplished by the end of FY 92 have been realized. Specifically, the objectives for African American and American Indian/Alaskan Natives males in the Professional Job Category have been accomplished. Also, the hiring objective for African Americans, Hispanics, and Asian American/Pacific Islander females in the Clerical Job Category have been met. Other accomplished hiring objectives are those established for (a) White females and Hispanic males in the Administrative Job Category; and (b) White and African American females in the Other Job Category. We are confident that the hiring objective for Caucasian females in the Professional Job Category will be met and that noteworthy progress will be made in accomplishing all other objectives.

Because of the IRC savings and the positive interactions that occurred during deliberations of the IRC Working Group, the Area Director intends to appoint a similar group for the Beltsville Area and another group for the National Arboretum in FY 1992 to provide input to and oversight of the IRC budget.

2.8 Security

Security remains a major issue due to the size of the Center, the sensitivity of selected programs, and the large number of buildings that must be kept under surveillance. The new Security Manager is doing an excellent job. During the year, all of the security officers completed basic police and vehicle safety training. Through improved workforce management, one position on the security force was eliminated, thereby reducing costs without adversely compromising the security program. Security was improved by the addition of eight new alarm systems and security lighting at new locations at BARC. Also, quarterly reports of Security Force activities are now being circulated to all DAD's to keep them informed of incidents or unusual trends that need special oversight. The Honeywell Computer System that is used to monitor alarms and sensors in buildings throughout the Center is beginning to become a maintenance problem. Plans for replacing this equipment will be developed during FY '92.

2.9 Appendix (Facility Modernization)

FISCAL YEAR 1991

Range 2 Greenhouses	$ 2,500,000
BARC Waste Water Treatment Facilities	5,650,000
BARC Electrical Distribution System	1,700,000
Building 001 - Design for Renovation	700,000
Building 029 Service Building Repairs	184,000
Building 050 HVAC Repairs	500,000
New Lab Building, BARC-W	1,000,000
Minor Miscellaneous Projects	1,860,000
Poultry House HVAC	122,000
BARC Annual Painting	200,000
BARC Annual Roof Repair	200,000
Granary Improvements	414,000
Demolition of Facilities	200,000
Swing Space/Relocation Costs	520,000
Central Collections Facilitiy	50,000
Free Stall Barn	200,000
	$16,000,000

FISCAL YEAR 1992
(Proposed Budget)

Construction of New Plant Science Laboratory (C)	$13,200,000
Phase I of Modernization of Range 2 Greenhouse Complex (C)	2,500,000
Building 157 Dairy Food Renovation (D&C)	250,000
Annual Painting	300,000
Annual Roofing	300,000
West Waste Water Treatment Plant (D)	300,000
Demolition of Old Facilities (D&C)	150,000
Consolidated Poultry Facilities (D&C)	925,000
Range 4 Repairs (D&C)	300,000
Insectary (D)	50,000
Bioscience Building HVAC Upgrade (D)	50,000
Fertilizer Storage (C)	60,000
Polyhouses (C)	112,000
Parking Lot Repairs (D&C)	375,000
Fence Repairs	90,000
Contingency	700,000
Miscellaneous Small Projects	338,000
	$20,000,000

FISCAL YEAR 1993
(Area Proposals)

Gut and Rebuild Building 001 (C)	$ 9,428,000
West Waste Water Treatment Facility (C)	3,932,000
Range 2 Greenhouse, Phase 2 (C)	3,400,000
BARC-East Water System (D)	466,000
Controlled Environment Chamber Facility (D)	322,000
Bioscience Building HVAC Upgrade (D)	350,000
BARC Parking Lot Repairs (C)	376,000
BHNRC Facility Needs Study (S)	300,000
Miscellaneous Small Projects (D&C)	471,000
Annual Painting (D&C)	400,000
Annual Roofing (D&C)	400,000
Demolition (D&C)	155,000
	$20,000,000

3. Major Program/Management Issues

This section provides a concise listing of the most important BA issues that need priority action or deserve Headquarters attention in FY '92. The issues are grouped by Institute or major unit that reports directly to the Area Director.

3.1 Natural Resources Institute (NRI)

Overview

- This Institute is funded at $12.1 M net to location. The IRC is $2.6 M or 21%.
- There are eight MU's with an average target percent salaries (TPS) of 66.8% and the average actual percent in salaries is 63.9%.
- The MU's are:
  - Climate Stress Laboratory
  - Electron Microscopy Laboratory
  - Environmental Chemistry Laboratory
  - Hydrology Laboratory
  - Pesticide Degradation Laboratory
  - Remote Sensing Research Laboratory
  - Soil Microbial Systems Laboratory
  - Systems Research Laboratory
- There are 56 PFT SY's, 28 PFT Support Scientists and Research Associates. The average discretionary funds per SY is $45,422.

Accomplishments post 1991 ARMPS:

- Obtained the highest resolution on frozen biological samples ever achieved in the United States using a cold stage on a field emission scanning electron microscope.
- Discovered that light quality had a impact on the nutritional status of soybeans by altering their fatty acid composition.
- Isolated, purified and sequenced two major enzymes that degrade atrazine, the major herbicide detected in groundwater.
- Obtained a second patent on the pesticide wastewater degradation unit.
- Gathered sufficient data to do a complete balance of pesticide residues in a major groundwater study.
- Showed that elevated CO2 ameliorates ozone damage in wheat.
- Demonstrated that polyamines accumulate in plants in response to UV stress.
- Produced the first NMR image of liver tumors in a fish resulting from organic pollution in a major U. S. river.
- Proved that grass cover crops were 3-4 times more efficient than legumes in reducing nitrate leaching to groundwater.

- List of Management Units:
  - Bee Research Laboratory
  - Biocontrol of Plant Diseases Laboratory
  - Florist and Nursery Crops Laboratory
  - Fruit Laboratory
  - Insect Biocontrol Laboratory
  - Insect Chemical Ecology Laboratory
  - Inset Neurobiology and Hormone Laboratory
  - Microbiology and Plant Pathology Laboratory
  - National Germplasm Resources Laboratory
  - Nematology Laboratory
  - Plant Molecular Biology Laboratory
  - Soybean and Alfalfa Research Laboratory
  - Systematic Botany and Mycology Laboratory
  - Systematic Entomology Laboratory
  - Vegetable Laboratory
  - Weed Science Laboratory.

Accomplishments Post 1991 ARMPS:

- Developed 26 new CRIS projects during FY '91.
- Worked closely with RL's to develop simple format for 5 year plans to effectively and efficiently focus human and fiscal resources.
- A&E design contract for new PSI building was awarded on schedule and within budget.
- New annual awards program established to recognize PSI outstanding secretary, technician, and support scientist of the year.
- IRC increase for PSI held to 3.5%; net to location increased by $1.9 million (6.6%); obtained $1.9 million in "soft funds."
- Technology transfer documented by 10 CRADA's totaling $689,000.
- Range 2 Greenhouse modernization underway; scheduled for design completion by October 1991; construction scheduled to begin May 1992.
- Procurement of new computer for GRIN program was completed ahead of schedule and under the projected cost.

Strengths:

- All management units have 5-year plans in place for annual updating in concert with development of ARMPS.
- PSI received 8 headquarters-funded research associate positions for FY '91.
- Over 220 manuscripts, 177 abstracts, and 6 patent applications prepared during FY '91.
- A strong safety program exists in PSI, with cash award recognition for PSI collateral duty safety officers and non-PSI staff contributing to PSI safety program.
- Developed highly efficient and streamlined communication lines with RL's, SY's, and support staff.
- RL's and SY's in MU's realigned in FY '90 (ICEL, INHL, BRL, NGRL, and IBL) are functioning effectively.

- The MU's are:
  - Animal Improvement Programs Laboratory
  - Biosystematic Parasitology Laboratory
  - Gene Evaluation and Mapping Laboratory
  - Germplasm and Gamete Physiology Laboratory
  - Helminthic Diseases Laboratory
  - Livestock Insects Laboratory
  - Milk Secretion and Mastitis Laboratory
  - Nonruminant Animal Nutrition Laboratory
  - Protozoan Diseases Laboratory
  - Ruminant Nutrition Laboratory
  - Zoonotic Diseases Laboratory
  - Research Animal Services
  - Veterinary Services
- There are 64 PFT SY's and 21 Research Associates with $50 K discretionary funds per SY.

Accomplishments Post 1991 ARMPS

- Scientists summarized their research in 191 peer reviewed manuscripts, 156 abstracts, and 55 items identified as technology transfer.
- Animal model genetic evaluations of dairy cattle were distributed to breeders, dairy records processing centers, AI organizations and breed associations.
- Radioimmunoassay kits for chicken LH and FSH were prepared for distribution worldwide through the USDA Animal Hormone Program.
- A method for testing horsemeat for trichineollis was developed for the USDA-Agricultural Marketing Service and the U.S. horsemeat industry.
- Animal Biotechnology Cambridge, Ltd., a British biotechnology firm has filed for nonexclusive rights to a USDA patent to sex semen of mammals.
- Genetically engineered coccidial antigens were provided to Embrex Corporation for studies on embryo vaccination for the control of coccidiosis.
- Solar-charged portable electrocuting trap for stable flies for use in outdoor areas was developed.
- New identification key for medium stomach worms of cattle and sheep was developed to improve the capabilities for identifying gastrointestinal stages of the species.
- Reduction in carcass fat in boilers was accomplished by changing dietary protein levels, the amino acid blends, and feed restriction protocols.
- Showed that growth hormone treatment reduced the systems of stress in cattle through enhanced immune or disease fighting functions.
- A recombinant antigen for serodiagnosis of bovine cysticercosis was developed.
- A milk product developed from specifically immunized cows was found to prevent and reduce the severity of diarrhea caused by cryptosporidia.
- Discovered that keratin, which lines the teat canal, provides a mechanism to prevent bacterial passage into the mammary gland.

Issues:

- Consolidation of HCQL employees in one location as soon as possible is desirable.
- Gutters, roofs, and flashings on Buildings 201 and 204 have leaks.
- The roof of Building 002 leaks.
- The Minor Use Program in PAL lacks sufficient funds to support the minimum staff of one professional and one clerical assistant.

Actions:

- A study will be made to determine the feasibility of renovating a few rooms in Building 002 to provide additional space for consolidating HCQL in one building by 1993.
- A study will be made in FY '92 to determine if Building 201 is worth repairing. The roof of Building 204 will be repaired.
- The roof of Building 002 will be repaired.
- NPS and BA will explore options for funding the Minor Use Program.

3.5 Beltsville Human Nutrition Research Center (BHNRC)

The Center is funded at $7.8 M, net to location. The IRC for the Center is $1.9 M, corresponding to 24.6%. BHNRC received a budget increase of $270,000 during FY '91, to strengthen the lipid and antioxidant research programs. Two large human studies are planned, one in collaboration with and funded by the Vegetable Oils and Shortening Institute, the other with the Northern Regional Research Center. Collaboration with Institutes of the National Institutes of Health will continue with our Nutrient Composition and Vitamin and Mineral Nutrition Labs. The exact budget for that collaboration is not yet known.

- The Center consists of five Laboratories:
  Carbohydrate Nutrition Laboratory
  Energy & Protein Nutrition Laboratory
  Lipid Nutrition Laboratory
  Nutrient Composition Laboratory
  Vitamin & Mineral Nutrition Laboratory.

- The Center has 32 permanent SY's and 8.5 temporary SY's. The discretionary funds are on the average $30,690/SY, but two laboratories (CNL and NCL) are below $20,000.

Accomplishments Post 1991 ARMPS:

- Scientists maintained a high level of productivity. During the first 9 1/2 months of FY 1991, 74 papers were approved for peer-reviewed Journals, 84 abstracts, 13 symposium proceedings, 6 book chapters, 11 Government publications, 9 review articles and 6 others.

3.6 U.S. National Arboretum (USNA)

Overview:

- o USNA is funded at $4.18 M (including Delaware Unit $318,469) net to MU. This does not include $0.74M for R&M. The IRC is $1.79M or 43% (recurring).
- o There are five MU's with overall salary-to-all other (net to CRIS) of 47.3/52.2; the overall TPS is 43.3%.
- o The MU's are:
  - Research Unit
  - Germplasm Unit
  - Gardens Unit
  - Education Unit
  - Administrative (Facilities Unit)
- o There are seven PFT SY's, two PFT service scientists (Category 4, GS/GM-11 to 15). Discretionary funds (all other) per SY is $43,695.

Accomplishments Post 1991 ARMPS:

- o A comprehensive plan, land assignments, and advisory committees are now functioning for the Germplasm Unit to manage the depository.
- o Introduction of highly significant Lagerstroemia and Ulmus cultivars for the nursery industry.
- o Two SY's from the ARS Delaware, Ohio, worksite were redirected to develop new and more rapid techniques to identify valuable germplasm of landscape trees and shrubs to reduce dependency on pesticides.
- o The New American Friendship Garden was dedicated on April 24, 1991 in response to the contributions of the 300,000 members of the National Council of State Garden Clubs, Inc. The natural garden emphasizes native plants, reduced dependence on chemicals, and low maintenance.
- o An International Symposium "Preserving Our Genetic Diversity" was held on May 24-25, 1990, sponsored by Institute de la Vie and funded by RJR - Nabisco Co.
- o Construction was completed for the John Y. Naka Pavilion for the dedication of the North American Bonsai for October 1, 1990. Approximately 60 Bonsai of North American origin or design are on display in a new complex of pavilion, offices, gardens, toilets, educational center, and storage facilities.
- o The National Grove of State Trees was dedicated on June 20, 1991, with the plantings of the state trees for 10 states (Arkansas, Delaware, Georgia, Illinois, Iowa, Maryland, Nebraska, South Dakota, Texas, and Virginia). Twenty states will be planted in the years 1992 and 1993.
- o The $739,633 R&M recurring appropriation permitted more than 10 major projects to proceed.